

Space Weather Highlights
18 – 24 April 2005

SWO PRF 1547
26 April 2005

Solar activity was very low. The largest event of the period was a B8.0 flare from Region 755 (S12, L=328, class/area, Cao/020 on 19 April) at 19/2217 UTC. This event had an associated Type II (1128 km/s) and a CME with an estimated speed of 776 km/s. The CME was directed to the East and was not geoeffective. By 24 April, no sunspots were observed on the visible disk; however, a new active region was rotating into view near S06. The remainder of the disk was quiet and stable.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. Solar wind speed ranged from a low of near 325 km/s to a high near 600 km/s. Solar wind speed was generally around 400 km/s until 20 April when a coronal hole high speed stream (HSS) rotated into geoeffective position. Wind speed increased to about 600 km/s but gradually declined to 450 km/s on 22 April. Solar wind speed was slightly enhanced around 450 km/s until another HSS caused the speed to increase early on 23 April. Wind speed remained around 550 km/s until the end of the period.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 18 and 19 April.

The geomagnetic field ranged from quiet to major storm levels. The period started out with quiet to unsettled levels on 18 April. On 19 April, conditions were mostly quiet to unsettled with isolated active conditions. A solar sector boundary crossing occurred mid-day on the 19th followed by a geoeffective HSS on 20 April causing quiet to minor storm conditions with minor and major storm periods at high latitudes. Conditions settled down to quiet to unsettled conditions on 21 – 24 April with an isolated active period occurring on 24 April.

Space Weather Outlook
27 April – 23 May 2005

Solar activity is expected be at very low to low levels with a slight chance for M-class activity from new Region 756 (S07, L=228, class/area, Dko/550 on 26 April).

A greater than 10 MeV proton event is not expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 27 - 29 April, 02 – 08 May, and 10 – 16 May.

The geomagnetic field is expected to range from quiet to major storm levels. Recurrent coronal hole high speed wind streams are expected to produce unsettled to major storm levels on 01 – 03 May; and unsettled to minor storm levels on 09 – 11 May. Quiet to active levels are expected on 17 – 18 and 20 – 22 May. Otherwise, expect quiet to unsettled conditions.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
18 April	81	44	180	A4.8	0	0	0	1	0	0	0	0
19 April	78	43	140	A3.5	0	0	0	0	1	0	0	0
20 April	77	39	130	A2.5	0	0	0	0	0	0	0	0
21 April	77	22	70	A1.5	0	0	0	0	0	0	0	0
22 April	77	34	80	A2.6	0	0	0	0	0	0	0	0
23 April	79	35	80	A5.5	0	0	0	0	0	0	0	0
24 April	82	0	0	B1.1	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
18 April	6.4E+5	1.5E+4	3.5E+3		4.2E+8	
19 April	1.4E+6	1.5E+4	3.6E+3		6.8E+7	
20 April	4.7E+5	1.4E+4	3.4E+3		5.8E+6	
21 April	2.9E+5	1.5E+4	3.3E+3		4.3E+6	
22 April	3.1E+5	1.4E+4	3.2E+3		1.0E+7	
23 April	3.1E+5	1.4E+4	3.0E+3		7.6E+6	
24 April	3.2E+5	1.4E+4	3.1E+3		6.3E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	18 April	5	1-2-2-1-1-1-2-2	14	1-3-3-3-5-2-1-1	8
19 April	6	1-2-3-1-2-1-1-2	8	2-2-4-1-3-1-0-1	8	2-2-4-1-2-2-2-2
20 April	12	2-4-3-3-3-2-1-2	31	3-4-5-6-5-3-2-2	21	2-5-4-4-4-3-2-2
21 April	2	1-0-1-0-1-1-1-0	2	1-0-1-0-0-0-1-1	4	2-0-1-1-1-2-1-1
22 April	7	3-1-0-1-3-2-2-2	8	2-2-1-1-4-2-2-1	9	2-2-1-1-3-2-3-2
23 April	5	1-0-1-1-2-2-2-2	5	1-1-1-2-1-2-1-2	6	1-1-2-2-2-2-2-2
24 April	5	2-2-1-1-2-1-1-2	9	3-3-2-2-3-1-1-2	10	3-4-2-2-2-2-2-2

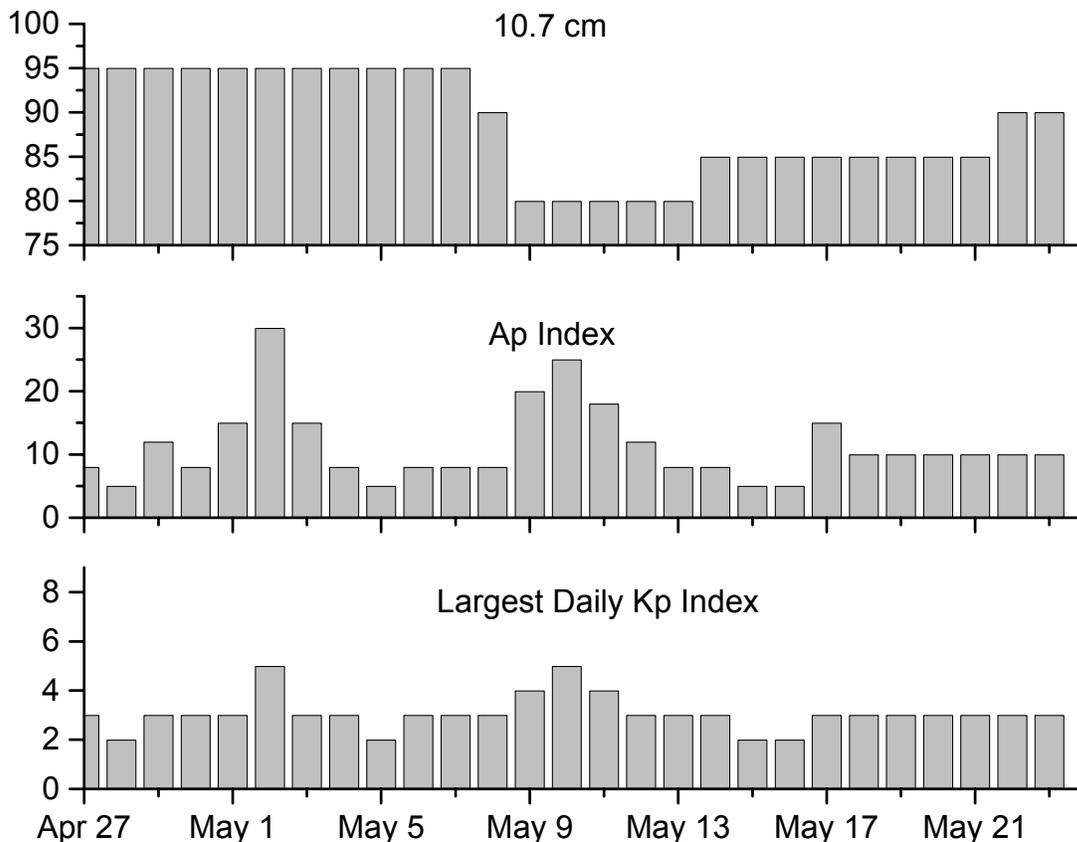


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
18 Apr 0019	245 MHz Radio Burst	17 Apr
18 Apr 0515	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	18 Apr 0500
18 Apr 1749	ALERT: Geomagnetic K= 4	18 Apr 1747
19 Apr 0726	ALERT: Geomagnetic K= 4	19 Apr 0725
19 Apr 1348	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	19 Apr 1340
19 Apr 2221	ALERT: Type II Radio Emission	19 Apr 2150
20 Apr 0423	ALERT: Geomagnetic K= 4	20 Apr 0420
20 Apr 0432	ALERT: Geomagnetic K= 5	20 Apr 0428
20 Apr 0714	ALERT: Geomagnetic K= 4	20 Apr 0713
20 Apr 1128	ALERT: Geomagnetic K= 4	20 Apr 1127
20 Apr 1349	ALERT: Geomagnetic K= 4	20 Apr 1344
23 Apr 1729	WARNING: Geomagnetic K= 4	23 Apr 1730 – 24/1500
23 Apr 1735	ALERT: Geomagnetic K= 4	23 Apr 1734



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
27 Apr	95	8	3	11 May	80	18	4
28	95	5	2	12	80	12	3
29	95	12	3	13	80	8	3
30	95	8	3	14	85	8	3
01 May	95	15	3	15	85	5	2
02	95	30	5	16	85	5	2
03	95	15	3	17	85	12	3
04	95	8	3	18	85	10	3
05	95	5	2	19	85	10	3
06	95	8	3	20	85	10	3
07	95	8	3	21	85	10	3
08	95	8	3	22	90	10	3
09	90	20	4	23	90	10	3
10	80	25	5				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
			Class	Flux	Lat	CMD	#	245	2695	II

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location	Rgn
	Begin	Max	End	X-ray Class.		Lat	
18 April	0436	0440	0442	B1.3			755
	0557	0600	0602	B1.4			755
	1436	1439	1443	B1.0			752
	1457	1503	1510	B3.7	Sf	N02W07	752
	2002	2006	2010	B1.0			
	2106	2111	2115	B2.5			752
	2252	2255	2258	B1.2			754
19 April	B2149	2152	2218	B8.0	1f	S12E56	755
20 April	<i>No Flares Observed</i>						
21 April	<i>No Flares Observed</i>						
22 April	0248	0253	0300	B1.1			754
23 April	0051	0115	0209	B1.8			
	2026	2108	2119	B3.0			
	2330	2336	0013	B2.0			
24 April	0145	0155	0201	B3.7			
	1213	1222	1226	B3.6			
	1315	1320	1324	B2.3			
	1723	1732	1745	B5.7			

Region Summary

Date	Location		Sunspot Characteristics				Flares									
	Helio		Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical					
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4	
<i>Region 752</i>																
12 Apr	N00E76	033	0080	10	Dso	003	B	1			1					
13 Apr	N01E56	040	0150	10	Dao	008	B									
14 Apr	N01E43	040	0160	11	Eai	010	Bg									
15 Apr	N01E30	040	0140	11	Eso	008	Bg									
16 Apr	N02E14	043	0090	07	Dso	005	B									
17 Apr	N02E00	043	0110	07	Cso	008	B	1								
18 Apr	N01W13	043	0110	07	Cao	009	B				1					
19 Apr	N03W28	045	0110	06	Cao	006	B									
20 Apr	N02W40	044	0080	07	Cso	004	B									
21 Apr	N03W55	046	0060	02	Hsx	001	A									
22 Apr	N03W70	048	0060	02	Hsx	001	A									
23 Apr	N03W85	049	0060	02	Hsx	001	A									
								2	0	0	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude:043



Region Summary – continued.

Date	Location		Sunspot Characteristics				Flares											
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 754</i>																		
14 Apr	S08E51	032	0080	04	Dai	005	B											
15 Apr	S08E38	032	0050	05	Cso	007	B											
16 Apr	S08E23	034	0040	05	Dso	005	B											
17 Apr	S08E11	032	0030	04	Cso	004	B											
18 Apr	S07E00	030	0030	05	Cso	004	B											
19 Apr	S08W15	032	0010	03	Cso	004	B											
20 Apr	S08W29	033	0030	03	Cso	004	B											
21 Apr	S07W38	029	0000	00		000												
22 Apr	S07W57	035	0010	03	Bxo	002	B											
23 Apr	S07W71	035	0010	01	Axx	001	A											
24 Apr	S07W84	035																
									0	0	0	0	0	0	0	0	0	0
Still on Disk.																		
Absolute heliographic longitude:030																		
<i>Region 755</i>																		
17 Apr	S11E76	327	0030	02	Hax	001	A	3				1						
18 Apr	S11E67	323	0040	01	Hax	001	A											
19 Apr	S12E49	328	0020	03	Cao	003	B						1					
20 Apr	S12E37	327	0020	01	Hsx	001	A											
21 Apr	S12E21	330	0010	01	Hsx	001	A											
22 Apr	S11E09	329	0010	01	Hsx	001	A											
23 Apr	S12W02	326	0010	01	Axx	003	A											
24 Apr	S12W15	326																
									3	0	0	1	1	0	0	0	0	0
Still on Disk.																		
Absolute heliographic longitude:326																		

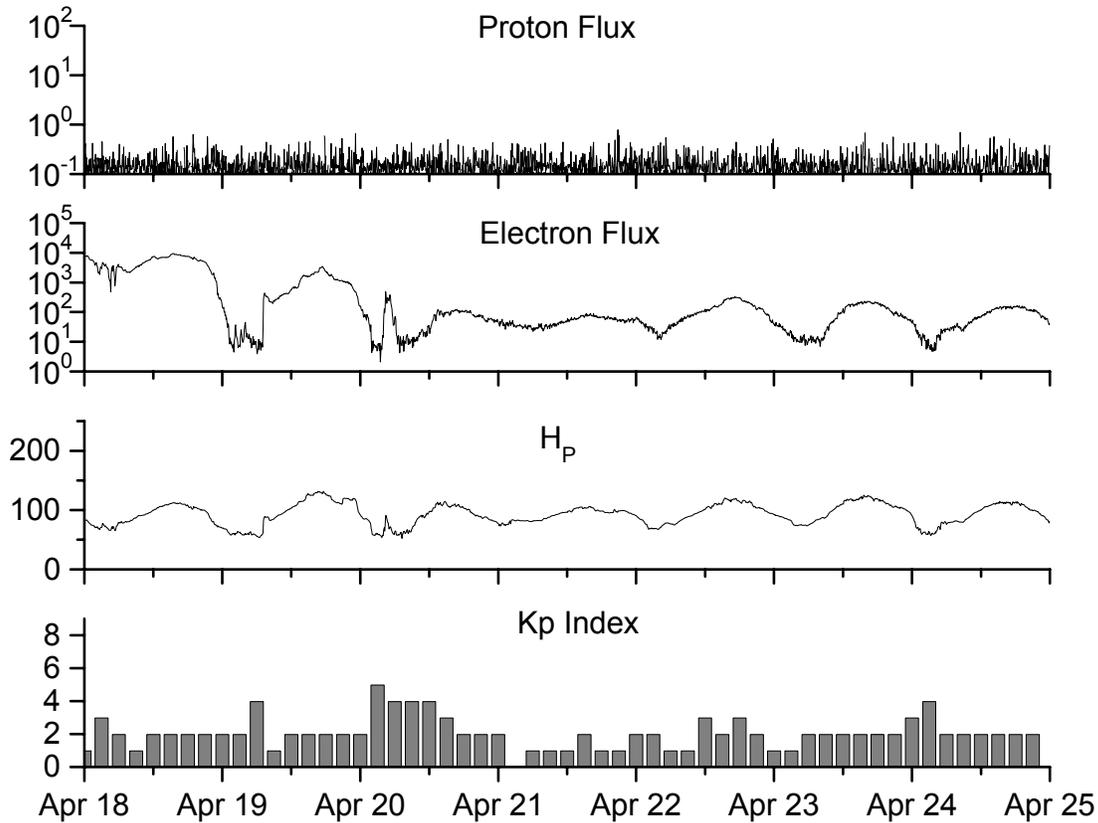


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2003									
April	119.7	60.0	0.50	121.5	70.3	126.3	135.0	20	20.1
May	89.6	55.2	0.62	118.3	67.8	129.3	133.1	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	130.2	24	21.5
July	132.8	85.0	0.64	106.9	62.0	127.8	127.2	19	22.0
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
2004									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62			105.7		9	
November	70.5	43.7	0.62			113.2		26	
December	34.7	17.9	0.52			94.6		11	
2005									
January	52.0	31.3	0.60			102.4		22	
February	45.4	29.1	0.64			97.3		11	
March	41.0	24.8	0.60			90.0		12	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 18 April 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W112) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

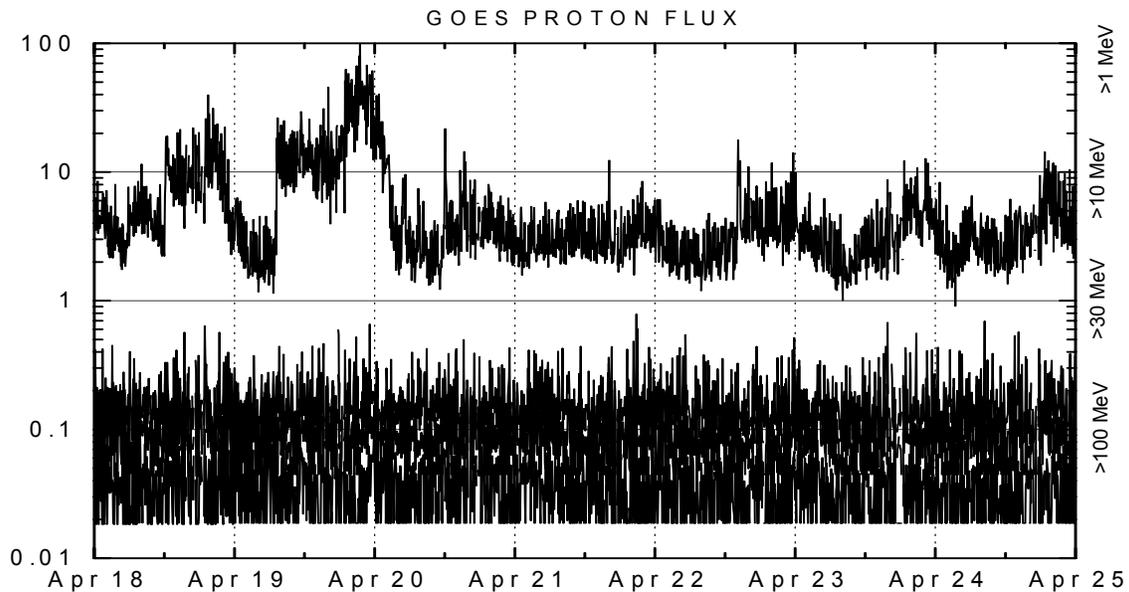
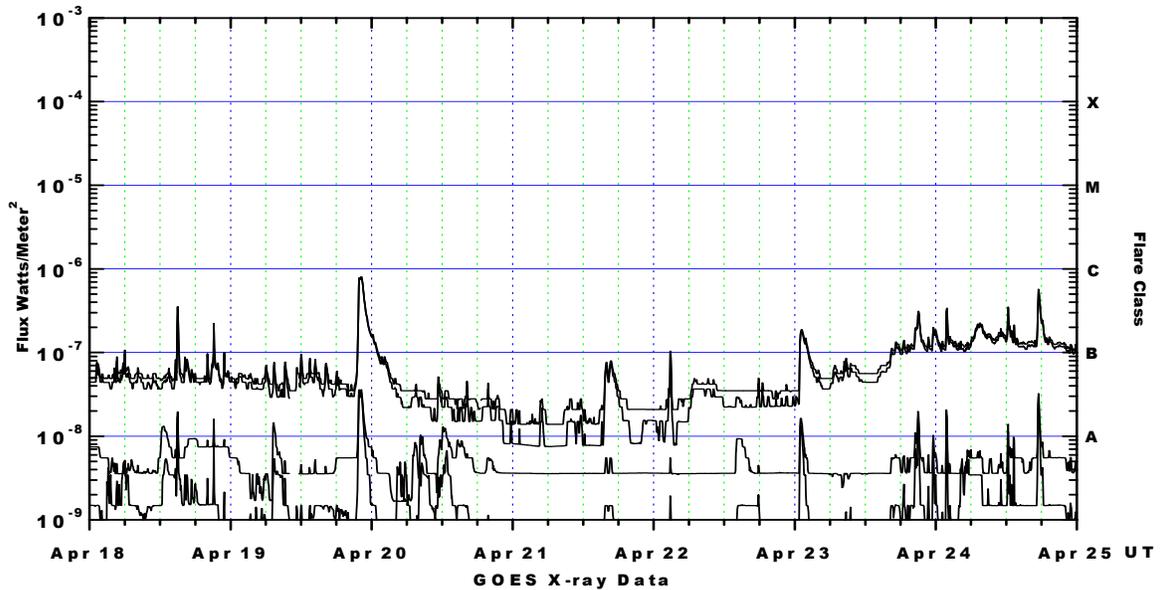
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are "global" parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m^2) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 (W112) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.

